Beamont Primary School

Science



Curriculum INTENT

Areas of working scientifically: Fair & comparative testing Research using secondary sources Identifying, classifying & grouping Pattern seeking Observing over time

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| **C:\Users\k.blundell\Desktop\beamont badge.pngBeamont Primary School- SCIENCE progression through EYFS**  **UTW- The Natural World** | | | | | | | | | |
| **Playing & Exploring - Engagement** | | | **Active Learning - Motivation** | | | **Creating & Thinking Critically - Thinking** | | | |
| * Finding out & exploring * Playing with what they know * Being willing to ‘have a go’ | | | * Being involved & concentrating * Keep on trying * Enjoying achieving what they set out to do | | | * Having their own ideas (creative thinking) * Making links (building theories) * Working with ideas (critical thinking) | | | |
| Understanding the World- The Natural World ELG -  - Explore the natural world around them, making observations and drawing pictures of animals and plants  - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class  - Understand some important processes and changes in the natural world around them, including the seasons | | | | | | | | | |
| Focus | Seasonal changes | Everyday materials | | | Plants | | Animals including Humans | | Vocabulary- To be used daily. |
| Nursery  Skills | • Explore different habitats outdoors, e.g. scent, colour & shape of flowers attracting bees  • Observe growth & decay over time  • Begin to understand the need to respect & care for the natural environment & all living things  • Talk about what they see, using a wide vocabulary | * Explore materials with different properties * Explore natural materials, indoors and outdoors. * Explore collections of materials with similar and/ or different properties. * Talk about the differences between materials and changes that they notice. | | | • Observe plants closely through a variety of means e.g. magnifiers & photographs  • Begin to understand the need to respect & care for the natural environment & all living things  • Extend vocabulary: leaves, petals, roots, bulb, trunk, branches, stem, garden plants, wild plants, seeds  • Use all the senses in hands-on exploration of plants  • Understand the key features of the life cycle of a plant | | • Observe animals closely through a variety of means e.g. magnifiers & photographs  • Look at key stages of development from birth to adult  • Observe & describe in words or actions the effects of physical activity on body  • Understand the key features of the life cycle of a butterfly  • Understand the key features of the life cycle of an animal | | Senses, experiment, plants – leaf, stem, root, flower, animals, humans, materials, change, growth, environment, heavy, light, float, sink, baby, toddler, child, egg, caterpillar, chrysalis, seasons, melt, freeze, hard, soft, kitten, puppy, foal, calf etc |
| Nursery Knowledge | **Autumn**  **Families/ Colours and feelings** | | | **Spring**  Traditional tales and animals/ Growth and Change | | | | **Summer**  Adrift/ Transport / Chester Zoo | |
| • Name & identify body parts- facials features, arms, legs, fingers and toes  • Know the names of different body parts & what they do  •Know about the different seasons & the effect they have on plants, tress &creatures  •Using images can sequence the change from baby to child  •Use all their senses in hands-on exploration of natural materials | | | • Know the names of animal babies  • Most plants start growing from a seed or bulb  • All plants need water & light to grow & survive  • Know the correct terms to describe the life-cycle of a butterfly  • Know how to care for plants  • Know & talk about the life-cycle of a plant  • Know the names of the basic parts of a plant & tree  • Can use a magnifying glass | | | | • Know the effects of exercise on the body e.g. heart beats faster, get hotter  • Know the different properties of material e.g. wood, plastic, metal  • Know why some objects float & sink | |
| Children to be exposed to key vocabulary daily in provision. High quality text to be chosen for story times that allow for questioning opportunities relating to key events. The outdoor classroom will be used as a key feature in our science learning through the natural world. Trips to the farm and the zoo will be used to enhance children experiences of animals and class experiences of hatching our own chicks and caring for our own caterpillars/butterflies. | | | | | | | | | |

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| **C:\Users\k.blundell\Desktop\beamont badge.pngBeamont Primary School- SCIENCE progression through EYFS**  **UTW- TheNatural World** | | | | | | | | | | | |
| **Active Learning - Motivation** | | | | **Active Learning - Motivation** | | | | **Creating & Thinking Critically - Thinking** | | | |
| * Being involved & concentrating * Keep on trying * Enjoying achieving what they set out to do | | | | * Being involved & concentrating * Keep on trying * Enjoying achieving what they set out to do | | | | * Having their own ideas (creative thinking) * Making links (building theories) * Working with ideas (critical thinking) | | | |
| Understanding the World- The Natural World ELG -  - Explore the natural world around them, making observations and drawing pictures of animals and plants  - Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class  - Understand some important processes and changes in the natural world around them, including the seasons | | | | | | | | | | | |
| Focus | Seasonal changes | | Everyday materials | | | Plants | | Animals including Humans | | | Vocabulary- To be used daily. |
| Reception  Skills | • Describe what they see, hear & feel whilst outside  • Observational drawings of the natural world  • Discuss how to care for the living things & their habitats  • Examine change over time  • Express opinions on natural & built environments & opportunities to hear different points of view on the quality of the environment. Use words such as busy, quiet, pollution  • Understand the effect of changing seasons on the natural world around them | | * Explore collections of materials with similar and/ or different properties. * Talk about the differences between materials and changes that they notice   •Characteristics of liquids & solids e.g. cooking eggs, melting chocolate  • Observe & interact with natural processes, such as ice melting, a sound causing a vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object & a boat floating on water | | | • Extend vocabulary: blossom, buds, bulb, evergreen, deciduous  • Describe what they see, hear & feel whilst outside  • Name & describe some plants  • Draw pictures of plants | | • Shows some understanding that good practices with regard to exercise, eating, drinking water, sleeping & hygiene can contribute to good health  **•** Describe what they see, hear & feel  • Identify different parts of their body & animals  • Be able to show care and concern for living things  • Know the effects exercise has on their bodies  • Have some understanding of growth and change  • Talk about things they have observed including animals  • Observational drawings of animals | | | Test, fair, why, senses, world, plants – leaf, stem, root, flower, animals, humans, materials - waterproof, natural, change, growth, decay, environment, heavy, light, float, sink, stretch, snap, magnetic, baby, toddler, child, teenager, adult, egg, caterpillar, chrysalis, bark, stick, branch, seasons, melt, liquid, solid, hard, soft, kitten, puppy, foal, calf etc |
| Reception Knowledge | **Autumn**  Families and celebrations | | | | **Spring**  Under the sea/ Growth and Change | | | | **Summer 1**  **Fairy tales/ Chester Zoo** | | |
| * Can name own body parts using the text Funny Bones as a support. All above + shoulders, ribs, backbone, knees, elbow * Can piece back together the parts of the body and locate upon request. * Can describe key function of the skeletal system * Can describe what changes occur as they change from a baby to an adult * Can name the 4 seasons * Can talk about similarities and differences between each season * Can name the characteristics of each season | | | | • All plants need water, light and warmth to grow and survive  • A seed produces roots to allow water to get into the plant and shoots to produce leaves to collects the sunlight  • Use correct terms e.g. chrysalis, pupa when observing life cycle of butterfly & ladybirds  •Can describe the life cycle of a chick using correct terminology eg embryo, incubation, hatching  •Knows that meat is produced from animals | | | | •Know the effects of heating and cooling on ingredients such as melting and freezing  •Can classify a set of objects by their materials- Wood, plastic, fabric, and glass.  •Can name the characteristics of materials  •Can describe the most suitable materials for building and give explanations as to why. | | |
| Seasonal changes | | Everyday materials | | | | | Plants | | | Animals including humans | |
| Children to be exposed to key vocabulary daily in provision. High quality text to be chosen for story times that allow for questioning opportunities relating to key events. The outdoor classroom will be used as a key feature in our science learning through the natural world. Trips to the farm and the zoo will be used to enhance children experiences of animals and class experiences of hatching our own chicks and caring for our own caterpillars/butterflies. | | | | | | | | | | | |

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| Year 1: Science skills progression | |
| **POS**  **Year 1 Seasonal changes**  •observe changes across the 4 seasons  •observe and describe weather associated with the seasons and how day length varies  **Year 1 Everyday materials**  •distinguish between an object and the material from which it is made  •identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock  •describe the simple physical properties of a variety of everyday materials  •compare and group together a variety of everyday materials on the basis of their simple physical properties  **Year 1 Plants**  •identify and name a variety of common wild and garden plants, including deciduous and evergreen trees  •identify and describe the basic structure of a variety of common flowering plants, including trees  **Year 1 Animals including humans**   * Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals * Identify and name a variety of common animals that are carnivores, herbivores and omnivores * Describe and compare the structure of a variety of common animals * Identify, name, draw and label the basic parts of the human and say which part of the body is associated with which sense | Working scientifically:   * asking simple questions and recognising that they can be answered in different ways * observing closely, using simple equipment * performing simple tests * identifying and classifying * using their observations and ideas to suggest answers to questions * gathering and recording data to help in answering questions. * Use books from the library service linked to Science topics |

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| **Year 1– End points** | |
| **Seasonal changes** | * Know the sun provides earth with warmth and light * Know in Autumn the leaves of many trees change colour, the temperature grows colder, plants stop making food and animals prepare for the months ahead * Know in Winter, it is usually the coldest time of the year and in some places, it brings freezing temperatures, snow, and ice * Know in Spring dormant plants, begin to grow again, new seedlings sprout out of the ground, plants grow new leaves and hibernating animals awake * Know in summer that it has long, usually sunny days and is the hottest season * Know that the movement of Earth in space gives us day and night * Know it takes the Earth a day to go around on its axis * Know that in the UK (United Kingdom), the day length is longest in the summer and shortest in the winter * Know that the moon goes around the Earth |
| **Everyday materials** | * know objects are things we can see or touch and can be made from one or more materials * know a material is the matter from which a thing is or can be made from * know a natural material is any product that comes from plants, animals, or the ground * know examples of natural materials are water, wood, rock, cotton, iron, oil, leather * know manufactured materials are materials that have been produced by man * know examples of manufactured materials are plastic, metal, glass, brick, paper, fabric, foil * Know that everything is made up of materials * Know materials can be grouped according to their properties * Know varied materials, have different properties * Name different properties: hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof; absorbent/not absorbent; opaque/transparent |
| Plants | * Know flowering plants, consist of leaves, flowers (blossom on trees), petal, roots, bulb or seed, trunk, or stem * Know wild plants, grow without human intervention, and garden plants are grown by human intervention * Know the wildflowers – dandelion, forget-me-not, thistles, daisy, poppy * Know the garden flowers – rose, fuchsia, geranium * Name deciduous trees – ash, oak, beech, silver birch, alder * Know deciduous trees shed their leaves in winter to conserve energy * Know evergreen trees, keep their leaves throughout the year * Name evergreen trees pine, spruce, cedar |
| **Animals including humans**  Classification of animals | * Know the animal kingdom is classified into fish, amphibians, reptiles, birds, and mammals * Know a carnivore feeds on other animals, examples are fox, shark, crocodile, frog, owl * Know an herbivore feeds on plants, examples are cows, pigeon, tortoise, parrotfish * Know an omnivore feeds on both animals and plants, examples are lizards, bears, yellow-legged frog, crow, goldfish * Know five of the senses are associated with the following: hands-touch; nose-smell; mouth-taste; eyes-see and ears-hear * Name examples of fish: trout, salmon, cod, plaice * Name examples of amphibians: frog, newt, toad * Name examples of reptiles: lizard, snake, turtle, alligator * Name examples of birds: sparrow, blackbird, robin, chicken * Name examples of mammals: humans, dog, rat, bear * Know animals can be warm or cold blooded |

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| Year 2: Science skills progression | |
| **POS**  **Year 2 Animals including humans**   * notice that animals, including humans, have offspring which grow into adults * find out about and describe the basic needs of animals, including humans, for survival (water, food and air) * describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene   **Year 2 Use of everyday materials**  ••identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses  •find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching  **Year 2 Plants**  observe and describe how seeds and bulbs grow into mature plants  •find out and describe how plants need water, light and a suitable temperature to grow and stay healthy  **Year 2 Living things and their habitats**   * explore and compare the differences between things that are living, dead, and things that have never been alive * identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other * identify and name a variety of plants and animals in their habitats, including microhabitats   describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food | Working scientifically:   * asking simple questions and recognising that they can be answered in different ways   • observing closely, using simple equipment  • performing simple tests  • identifying and classifying  • using their observations and ideas to suggest answers to questions  • gathering and recording data to help in answering questions.   * Use books from the library service linked to Science topics |

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| **Year 2– End points** | |
| **Animals including humans**  Animals basic needs | * Know all animals, need food, water, air, and shelter * Know animals, need to stay fit by eating sensibly and taking regular exercise * Know all animals, need to eat a balanced diet * Know the food groups are carbohydrates, proteins, fats, fruits and vegetables and dairy * Know all animals, have offspring which then grow into adults * Know some offspring are different from their adults e.g., caterpillar-butterfly, tadpole-frog * Know the four stages in a life are: birth, growth, reproduce and death * Know animals also need exercise and sleep to keep a body healthy * Know humans are hygienic to stop the spread of germs |
| **Use of everyday materials** | * Know that materials are picked for a specific purpose because of their properties * Know glass is made by melting sand and other minerals together at extremely hot temperatures. It is normally transparent and can be made into different shapes. Thick glass can be strong, but thin glass breaks easily * Know different fabrics, have different properties. They can be stretchy (a pair of tights), insulating (a woollen coat) or absorbent (a towel) * Know pans made from metal are strong, hard, and shiny materials that can be hammered into different shapes without breaking. They are good conductors of heat and electricity * Know plastics are materials made from chemicals. They are strong and waterproof, can be made into any shape by applying heat, are good insulators and do not conduct heat or electricity * Know furniture made from wood comes from trees. It is strong, flexible, and long-lasting and an insulator of heat and electricity * Know fabrics are used to make clothes as they are flexible, warm and do not wear out easily * Know the same object can be made using varied materials e.g., spoons can be made from wood, metal, plastic * Know some shapes of objects can be changed by squashing, bending, twisting, or stretching |
| **Plants** | * Know seeds and bulbs have a store of food inside them * Know plants, need light, water, air, nutrients, and space * Know that seeds and bulbs do not need light to germinate but need warmth. * Know the process to grow into mature plants includes growing roots, shoot appears through soil, plant takes nutrients from the soil and continues to grow * Know types of seed: sunflower apple, tomato, pea * Know types of bulbs: daffodil, tulip, bluebells, onions, garlic * Know that plants need water, light, warmth, and space to stay healthy |
| **Living things and their habitats** | * Know the difference between living (grow), dead (no longer alive) and never been alive (does not grow) * Know the 5 things all living things need – food, water, shelter, warmth, and space * Name different habitats for plants and give an example – grassland (ryegrass, wild oats), forest (ferns, foxgloves), pots (tomatoes, peas), desert (prickly pear, aloe vera, cactus), river (pondweed, waterweed), and tundra (artic moss, artic poppy) * Name habitats for animals and give examples – grassland (elephant, zebra, lion), desert (camel, scorpion), river (turtle, fish, crab), tundra (polar bear, snowy owl), and forest (squirrel, deer, bird) * Know what a microhabitat is - a small, specialized habitat within a larger habitat – decomposing log (earthworm, centipede, beetle), temporary pool of water (water mites), and under rocks (worm, ant, cricket) * Know animals obtain food from other animals and plants * Know how to explain a simple food chain and name various sources of food (grass, snail, bird) |
| **Energy** | * Know examples of common appliances that run on mains electricity are television, fridge/freezer, microwave, washing machine, lights * Know that everyday appliances use electricity; these include things that light up, heat up, produce sound, or move * Know examples of objects that use batteries are torches, mobile phones, calculators * Know a force is a push or a pull * Know that pushing or pulling things can make objects start or stop moving * Know that sometimes pushes and pulls change the shape of objects * Know that there are many different sources of sounds * Know how to make observations of sounds by listening carefully * Know that light sources give out light and the sun is a light source * Know that light is essential for seeing things * Know that sources of light show up best at night-time |

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| Year 3: Science skills progression | |
| **POS**  **Year 3 animals including humans**  •identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat  •identify that humans and some other animals have skeletons and muscles for support, protection and movement  **Year 3 Light**  •recognise that they need light in order to see things and that dark is the absence of light  •notice that light is reflected from surfaces  •recognise that light from the sun can be dangerous and that there are ways to protect their eyes  •recognise that shadows are formed when the light from a light source is blocked by an opaque object  •find patterns in the way that the size of shadows change  **Year 3 Rocks**  •compare and group together different kinds of rocks on the basis of their appearance and simple physical properties  •describe in simple terms how fossils are formed when things that have lived are trapped within rock  •recognise that soils are made from rocks and organic matter  **Year 3 Plants**  •identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers  •explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant  •investigate the way in which water is transported within plants  •explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal  **Year 3 Forces and magnets**  •compare how things move on different surfaces  •notice that some forces need contact between 2 objects, but magnetic forces can act at a distance  •observe how magnets attract or repel each other and attract some materials and not others  •compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials  •describe magnets as having 2 poles  •predict whether 2 magnets will attract or repel each other, depending on which poles are facing | Working scientifically:  asking relevant questions & using different types of scientific enquiries to answer them  ● setting up simple practical enquiries, comparative & fair tests  ● making systematic and careful observations &, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers & data loggers  ● gathering, recording, classifying and presenting data in a variety of ways to help in answering questions  ● recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, & tables  ● reporting on findings from enquiries, including oral & written explanations, displays or presentations of results & conclusions  ● using results to draw simple conclusions, make predictions for new values, suggest improvements & raise further questions  ● identifying differences, similarities or changes related to simple scientific ideas and processes  ● using straightforward scientific evidence to answer questions or to support their findings.  Use books from the library service linked to Science topics |

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| **Year 3– End points** | |
| **Animals including humans** | * Know the right food is important for a healthy body * Know animals, get their nutrients from what they eat * Know all animals, need the right amount of nutrients from the food they eat * Know carbohydrates and fats provide energy, proteins help with growth and repair, vitamins and minerals keep cells healthy, fibre helps food move through the gut and 70% of the body is water * Know the skeleton does three jobs: protecting the body parts, supporting the body, and letting the body move. * Know bones, have joints so the skeleton can bend. * Know muscles and joints allow movement * Know muscles are soft tissues that are joined to bones and always work in pairs |
| **Light** | * Know a force can, make things slow down or speed up. * Know when an object moves on a surface, the texture of the surface and the object affect how it moves. * Know moving objects slow down quickly on rough surfaces. * Know moving objects do not slow down much on smooth surfaces. * Know that for some forces to act, there must be contact e.g., a hand opening a door, the wind pushing the trees * Know that magnets do not need to touch objects for a force to occur * Know most magnets have a North pole (N) and a South pole (S) * Know a North and South pole attract and like poles repel * Know monopole magnets only have one pole * Know only some materials are attracted to magnets – steel and iron |
| **Rocks** | * Know there are three main types of rocks and give an example – sedimentary (chalk, limestone, shale, sandstone), metamorphic (slate, marble, quartzite, anthracite) and igneous (basalt, granite, pumice, obsidian) * Know that rocks can be group based on physical properties and can give examples – hard/soft, permeable/impermeable or durability * Know that fossils are formed by a plant or animal dies in a watery environment, the plant or animal is buried in mud and silt, soft tissues quickly decompose leaving the hard bones or shells behind, over time sediment builds over the top and hardens into rock. * Know that soil is made from rocks and organic matter – clay, sandy, loamy, peaty, chalky, silty * Know that soil can help plants grow |
| **Plants** | * Know the flower is needed for reproduction * Know the leaves are needed for nutrition (leaves use sunlight to change carbon dioxide and water into food – photosynthesis) * Know the stem holds the plant up towards the light and carries water and minerals from the roots to the rest of the plant * Know the root anchors the plant and root hairs soak up water and minerals from the soil * Know water travels up a plant after being absorbed from the soil * Know that each flowering plant has a male (stamen) and female (carpel) part * Know the stamen contains pollen grains * Know the carpel contains the eggs * Know flowers are pollinated by insects or wind and pollen carried to stigma of another plant * Know that when pollen and egg join – a seed is made * Know the ovary becomes a fruit which contains the seeds e.g. acorn is the fruit of the oak tree * Know seeds are dispersed by wind, water, animals or by explosion |
| **Forces and magnets** | * Know a force can, make things slow down or speed up. * Know when an object moves on a surface, the texture of the surface and the object affect how it moves. * Know moving objects slow down quickly on rough surfaces. * Know moving objects do not slow down much on smooth surfaces. * Know that for some forces to act, there must be contact e.g., a hand opening a door, the wind pushing the trees * Know that magnets do not need to touch objects for a force to occur * Know most magnets have a North pole (N) and a South pole (S) * Know a North and South pole attract and like poles repel * Know monopole magnets only have one pole * Know only some materials are attracted to magnets – steel and iron |

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| Year 4: Science skills progression | |
| **POS**  **Year 4 animals including humans**  •describe the simple functions of the basic parts of the digestive system in humans  •identify the different types of teeth in humans and their simple functions  •construct and interpret a variety of food chains, identifying producers, predators and prey  **Year 4 Sound**  •identify how sounds are made, associating some of them with something vibrating  •recognise that vibrations from sounds travel through a medium to the ear  •find patterns between the pitch of a sound and features of the object that produced it  •find patterns between the volume of a sound and the strength of the vibrations that produced it  •recognise that sounds get fainter as the distance from the sound source increases  **Year 4 Electricity**  •identify common appliances that run on electricity  •construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers  •identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery  •recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit  •recognise some common conductors and insulators, and associate metals with being good conductors  **Year 4 Living things and their habitats**  •recognise that living things can be grouped in a variety of ways  •explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment  •recognise that environments can change and that this can sometimes pose dangers to living things  **Year 4 States of matter**  •compare and group materials together, according to whether they are solids, liquids or gases  •observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)  •identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature | Working scientifically:  asking relevant questions & using different types of scientific enquiries to answer them  ● setting up simple practical enquiries, comparative & fair tests  ● making systematic and careful observations &, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers & data loggers  ● gathering, recording, classifying and presenting data in a variety of ways to help in answering questions  ● recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, & tables  ● reporting on findings from enquiries, including oral & written explanations, displays or presentations of results & conclusions  ● using results to draw simple conclusions, make predictions for new values, suggest improvements & raise further questions  ● identifying differences, similarities or changes related to simple scientific ideas and processes  ● using straightforward scientific evidence to answer questions or to support their findings.  Use books from the library service linked to Science topics |

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| **Year 4– End points** | |
| **Animals including humans** | * Know that the digestive system breaks down food. * Know the digestive system consists of mouth, tongue, oesophagus, stomach, small intestine, and large intestine * Know the digestive system of a chicken includes mouth, tongue, oesophagus, stomach, small intestine, and large intestine * Know the digestive system of most reptiles and amphibians include mouth, oesophagus, stomach, small intestine, and large intestine * Know the digestive system of a salmon includes mouth, teeth, tongue, oesophagus, stomach, intestine * Know that some animals have more than one stomach to aid digestion e.g. alligator, cow * Know teeth are used to chew the food and break it up into bits * Know the tongue helps to chew the food and swallow it * Know that the oesophagus transports food to the stomach * Know that in the stomach the food is churned up and broken down further * Know in the small intestine the nutrients from the food are absorbed into the blood which transports them around the body * Know in the large intestine water is absorbed into the body * Know the four front teeth in both the upper and lower jaws are called incisors and are used to cut food. * Know there are four canines in the mouth which tear food and form the corners of the mouth. * Know the premolars are designed to crush and grind food. * Know the molars, have broader and flatter surfaces and grind food. * Know energy passes along the food chain * Know all food chains, start with a plant which is a producer as it makes its own food * Know that animals that eat plants are primary consumers * Know that primary consumers may be eaten by secondary consumers or predators |
| **Sound** | * Know that sounds are made by continuous vibrations and the vibrations sends waves into the ear * Know that sound can travel through varied materials and give examples – solid (metal, stone wood), liquid (water) and gas (air) * Know that the louder the sound (the stronger the vibrations) and sounds become fainter as the distance increases * Know that high pitch means fast vibrations and low pitch is slower vibrations |
| **Electricity** | * Know the basic parts of a simple circuit – cells, wires, bulbs, switches, buzzers * Know why a lamp in a simple circuit will (circuit is a complete loop) or will not light (break in the circuit) * Know that a switch open (will not light a bulb – circuit incomplete), switch closed (will light a bulb – circuit complete) * Know that conductors easily allow electric to pass through and insulators do not let electricity pass through easily * Know that an example of a good conductor is aluminium, copper, gold, water, people, and good insulators are rubber, plastics, wood, and paper |
| **Living things and their habitats** | * Know examples of how living things can be grouped – invertebrates (no backbone) vertebrates (have a backbone) and plants can be classified into flowering and non-flowering plants * Know how to use a classification key to help group, identify and name a variety of living things – e.g. Can it fly, does it crawl, does it belong in… * Know how to identify invertebrates (annelids, sponges, echinoderms, insects, molluscs, crustaceans, arachnids) and vertebrates (amphibians, birds, fish, mammals, and reptiles) * Know how environments can change and how it can potentially pose a danger to living things -global warming, litter, oil spill, chemical pollution, deforestation, and land development * Know environments can change and have a positive effect – nature reserves, parks and gardens, community gardens and ponds |
| **States of matter** | * Know that materials can be solids, liquids, or gases (the three states of matter) * Know the shape and volume of a solid does not change unless a bit is broken off * Know the shape of a liquid can change, depending on the container it is in, but its volume does not change * Know that most gases are invisible * Know the gas in a container completely fills the container so has the same shape and volume of the container it is in * Know liquids, change into gases when they are heated – this is evaporation * Know liquids, change into solids when they are cooled – this is freezing * Know gases, change into liquids when they are cooled – this is called condensation * Know solids, change into liquids when they are heated – this is called melting e.g. heating sand at elevated temperatures produces liquid glass * Know the rate of evaporation depends on the temperature * Know evaporation is slow when it is cold and fast when it is hot * Know the water on Earth is constantly recycling using evaporation and condensation * Know the heat from the sun makes the water from the sea, lakes and rivers evaporate into water vapour * Know that as the water vapour rises, it cools and condenses to form clouds, then falls as rain |

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| Year 5: Science skills progression | |
| **POS**  **Year 5 Animals including humans**  •describe the changes as humans develop to old age  **Year 5 Forces**  •explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object  •identify the effects of air resistance, water resistance and friction, that act between moving surfaces  •recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect  **Year 5 Earth and Space**  •describe the movement of the Earth and other planets relative to the sun in the solar system  •describe the movement of the moon relative to the Earth  •describe the sun, Earth and moon as approximately spherical bodies  •use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky  **Year 5 Living things and their habitats**  •describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird  •describe the life process of reproduction in some plants and animals  **Year 5 Properties and changes of materials**  •compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets  •know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution  •use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating  •give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic  •demonstrate that dissolving, mixing and changes of state are reversible changes  •explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda | Working scientifically:   * planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary   ● taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate  ● recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs  ● using test results to make predictions to set up further comparative and fair tests  ● reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations  ● identifying scientific evidence that has been used to support or refute ideas or arguments.  Use books from the library service linked to Science topics |

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| **Year 5– End points** | |
| **Animals including humans** | * Know prenatal development has a germinal phase, an embryonic phase, and a foetal phase * Know animals have different gestation periods * Know the stages in a human’s life, include infancy, childhood, adolescent, adulthood, and old age * Know cell decline is part of becoming old * Know vision and hearing decline as animals get older * Know animals have different lifespans * know the changes that take place in children during puberty * Know a girl's hormonal changes cause the ovaries to release eggs and the monthly menstrual cycle is triggered * Know a boy's muscles become more developed and facial and body hair begins to grow during puberty |
| **Forces** | * Know that friction is the force between surfaces that are touching. * Know rough surfaces, create lots of friction. * Know smooth surfaces do not create much friction. * Know friction produces heat. * Know air resistance is the force that slows down moving objects as they move through air. * Know objects, need to be streamlined to travel faster through the air and to travel slower through the air, you need a large surface area. * Know water resistance is the force that slows down moving objects as they move through water. * Know if you want to travel more quickly through water, the shape needs to be streamlined e.g. Dolphin has a streamlined body * Know that buoyancy is an object's ability to float in water or air. * Know that the force of gravity pulls objects towards the centre of the Earth regardless of where you are on the planet. * Know that Sir Isaac Newton (a British scientist) devised the laws of gravity * Know that the size of the gravitational force is more or less the same all over the Earth. * Know that levers, gears, and pulleys are simple mechanisms that enable a small force to have a greater effect * Know a lever is made from a long pole and pivot (fulcrum) examples are scissors, a wheelbarrow, and a stapler * Know a pulley is a rope running through a wheel, examples are window blinds, a flagpole and a well * Know gears are wheels with teeth that fit together. When one wheel is turned, the other wheel turns too but in the opposite direction. * Know that a smaller gear will turn faster than a larger one |
| **Earth and Space** | * Know that our solar system consists of our star, the Sun, and everything bound to it by gravity – the planets Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune * Know that dwarf planets such as Pluto; dozens of moons; and millions of asteroids, comets, and meteoroids are also within our solar system * Know Mercury, Venus, Earth and Mars are terrestrial planets * Know Jupiter and Saturn are giant gas planets and Uranus and Neptune are giant ice planets * Know that the Earth is a sphere, spins on an axis as it travels round the sun, when one sides faces the sun the other faces space * Know that the side facing the sun is bathed in light and heat (daytime) and the side facing space is cooler and darker (night) * Know that a day on Earth last 24 hours – how long it takes to orbit the sun * Know that the Earth’s tilt on its axis is what causes the 4 seasons. Sometimes it points towards the sun and other times it points away from the sun. * Know that the moon moves around the Earth in an approximately circular orbit, once around the Earth in approximately 27.3 days * Know that as the moon orbits the earth its position changes, relative to the stars. |
| **Living things and their habitats** | * Know that there are distinct types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals. * Know that sexual reproduction in plants involves pollen from one flower fertilising the egg of another to produce a seed. * Know asexual reproduction in plants happens without pollen or an egg. The new plant grows from cuttings from the parent plant. * Know the life cycle of a dolphin (mammal) - live young born and get milk from mothers, grow from babies to adults, reproduce * Know the life cycle of a newt (amphibian)- egg in jelly laid in water, develops tail, and legs, grows lungs to breathe and leaves water, takes 2 years to grow to adult size * Know the life cycle of a butterfly (insect) - eggs laid by the female insect; eggs hatch and larva are born; when the larva moults for the last time, a pupa is formed * Know some insects only have 3 stages: born as an egg, hatches as a nymph and changes into an adult * Know the life cycle of a robin (bird) – egg, hatches and is fed by the parents, juvenile– leaves the nest when flight feathers are grown, adult attracts mate to reproduce * Know the life cycle of an alligator (reptile) - egg, hatches able to feed itself but stays with mother for at least a year, juvenile, adult * Know the naturalist David Attenborough * Know the animal behaviourist Jane Goodall * Know amphibians and insects go through metamorphosis |
| **Properties and changes of materials** | * Know that heat travels from warmer materials to colder ones * Know that some materials let heat pass through them easily; these are thermal conductors (metals and sedimentary rocks) * Know some materials do not let heat pass through them; these are called thermal insulators (plastic, cork, wood, and fabrics) * Know that thermal insulators are good for keeping heat out as well as in * Know soluble materials dissolve in water * Know if a material does not dissolve, it is insoluble * Know dissolving a solid in water makes a solution * Know there are three ways to separate mixtures: sieving, filtering, and evaporation * Know sieving is when you pass a mixture of solids of varied sizes through mesh * Know filtering is when you pass a mixture of a solid and liquid through a mesh * Know evaporation separates soluble solids from water; the water evaporates and leaves the solid behind * Know in a reversible change a material turns into something that looks and feels different but is not changed forever – it can be changed back * Know all changes of state are reversible * Know mixing and dissolving are reversible changes * Know in an irreversible change a completely new material is formed and cannot be changed back * Know some things, react when you mix them (vinegar and bicarbonate of soda) to make new materials |

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| Year 6: Science skills progression | |
| **POS**  **Year 6 Animals including humans**  •identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood  •recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function  •describe the ways in which nutrients and water are transported within animals, including humans  **Year 6 Electricity**  •associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit  •compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches  •use recognised symbols when representing a simple circuit in a diagram  **Year 6 Living things and their habitats**  •describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals  •give reasons for classifying plants and animals based on specific characteristics  **Year 6 Evolution and inheritance**  •recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago  •recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents  •identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution  **Year 6 Light**  •recognise that light appears to travel in straight lines  •use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye  •explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes  •use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them | Working scientifically:   * planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary   ● taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate  ● recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs  ● using test results to make predictions to set up further comparative and fair tests  ● reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations  ● identifying scientific evidence that has been used to support or refute ideas or arguments.  Use books from the library service linked to Science topics |

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| **Year 6– End points** | |
| **Animals including humans** | * Know the circulatory system is made up of blood, blood vessels and the heart * Know blood moves food, waste oxygen and waste products around the body * Know there are three kinds of blood vessels: capillaries, veins, and arteries * Know arteries, carry oxygenated blood away from the heart to the body * Know veins, carry de-oxygenated blood back to the heart * Know exercise strengthens the muscles, develops the lungs, helps body coordination, uses up food for energy and can prevent the body getting fat and helps the body to sleep at nighttime * Know that taking health risks can damage the body * Know that smoking causes heart attacks, blocked arteries, lung cancer and breathing problems * Know sniffing solvents is extremely dangerous as damages the brain * Know that drinking alcohol slows down the reactions * Know heavy drinking damages the liver, heart, and stomach * Know drugs can be dangerous if misused and can cause damage to the brain * Know tobacco, sniffing solvent and some drugs are addictive |
| **Electricity** | * know when a switch is open, the circuit is incomplete * know that by adding more batteries the bulb gets brighter or the buzzer becomes louder as there is a greater current * know current is the amount of electricity flowing through the circuit * know that the higher the voltage of a battery, the more powerful it is – the more current flowing through a circuit * know that using higher voltage batteries causes a brighter bulb or a louder buzzer * know that if you add more bulbs, the bulbs get dimmer * Know that if you add more buzzers, they buzz more quietly * Know several motors would each turn more slowly than just one * Know using longer wires between the components provides more resistance so bulbs become dimmer, and buzzers quieten * Know that in parallel circuits, electrical components are connected alongside one another, forming extra loops. * Know the symbols of a simple circuit: |
| **Living things and their habitats** | * Know Carl Linnaeus as a pioneer of classification * Know to classify flowering plants into grasses, shrubs, cereals, and deciduous trees * Know to classify non-flowering plants into algae, mosses, ferns, and coniferous trees * Know to classify animals which are vertebrates – have backbones - (birds, fish, reptiles, mammals, amphibians) * Know to classify animals which are invertebrates – no backbones- into molluscs, annelids, arachnids, crustaceans, sponges, echinoderms, and insects * Know micro-organisms can be classified into bacteria, viruses, fungi, algae, and protozoa |
| **Evolution and inheritance** | * know humans can live all over the world because they can wear clothes and build houses suited to different conditions * know most plants and animals can only live in certain environments * know animals and plants are adapted to their habitat * know living things can develop adaptations to suit the place they live * know that the living things that are best adapted to their habitat are more likely to survive. * know that over time, increasingly the animals and plants will end up with features that make them well-adapted to their habitat * know that animals and plants produce offspring that look like their parents * Know parent plants or animals pass on characteristics * know when living things change over time – this is evolution * Know Charles Darwin’s (an English naturalist) scientific theory of evolution by natural selection became the foundation of modern evolutionary studies * Know an example of evolution is Darwin’s finches – beaks adapted over time based on food source * know that fossils show how living things have changed – how they have evolved |
| **Light** | * Know light is a form of energy * Know light travels in straight lines * Know objects are seen because they emit or reflect light into our eyes * Know light that is not reflected by a surface is absorbed * know that light travels from light sources to our eyes and from light sources to objects and then to our eyes * know because light travels in straight lines that shadows will have the same shape as the objects that cast them * Know how to use diagrams and models to describe how light travels in straight lines      * Know how to use diagrams and models to describe how light travels in straight lines when reflected from other objects      * Know how to use models and diagrams to describe light travelling in straight lines past an opaque/translucent object to cast a shadow of the same shape |